

NASA TECH BRIEF

Lyndon B. Johnson Space Center



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System for Simultaneous, Bidirectional Data Transmission

The problem:

Simultaneous, bidirectional transmission of data over a single two-conductor line has been accomplished using hybrid transformers. The transformers are relatively large and have limited frequency characteristics. Critical adjustment of balance components is necessary to maintain acceptable isolation between the input and the output signals.

The solution:

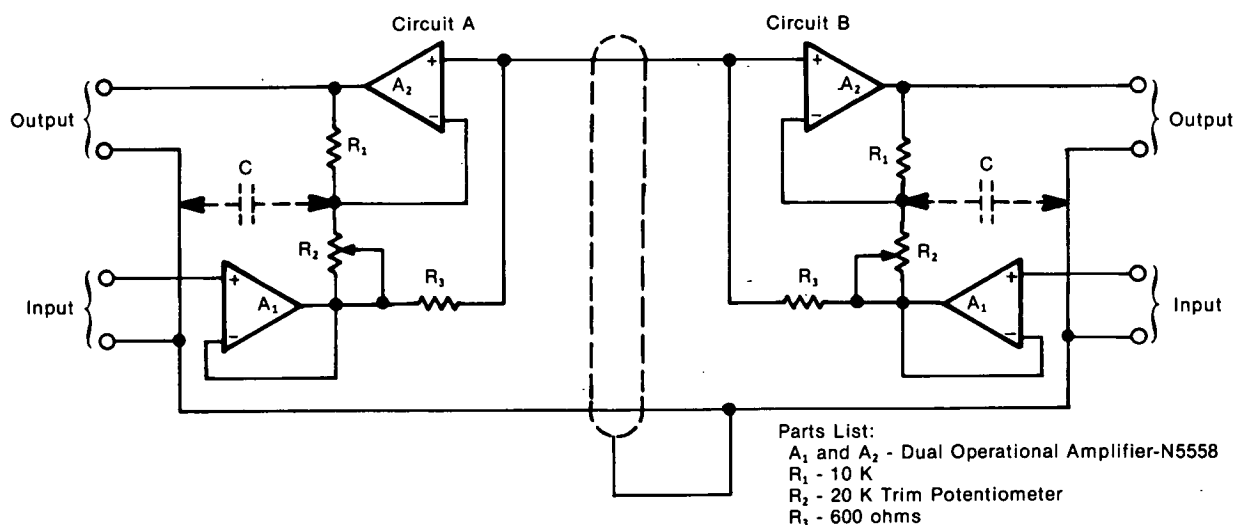
A single inexpensive system has been developed for simultaneous, bidirectional data transmission. System frequency response with presently available amplifiers is from dc to over 70 kHz.

How it's done:

As shown in the diagram, the system is made up of identical circuits A and B. Resistor R_3 , along with the

elements of the transmission line, determines the major load that is seen by buffer amplifier A_1 . Resistors R_1 and R_2 form a voltage divider which allows the input of A_2 to be balanced so that a signal applied at the input of A_1 is nulled at the output of A_2 . A signal introduced on the transmission line is fed through A_2 to the output. Transmission line reactances can be matched, to a large extent, by the selection of the proper value of capacitor C in each circuit.

For operation, resistors R_2 in circuits A and B are adjusted so that signals applied at the input terminals of A and B are nulled at their output terminals. The result is that a signal applied at the input of circuit A will appear at the output of circuit B, and a signal applied at the input of circuit B will appear at the output of circuit A.



System Circuit Diagram

(continued overleaf)

Note:

No further documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer
Johnson Space Center
Code AT3
Houston, Texas 77058
Reference: B75-10171

Patent status:

NASA has decided not to apply for a patent.

Source: G. C. Schmidt of
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